DOCUMENT RESUME

ED 296 465 EA 020 132

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TITLE Group Problem Solving.
INSTITUTION National Association of Elementary School Principals, Alexandria, VA.
PUB DATE Mar 88
NOTE 8p.; Blue print on colored paper may reproduce poorly.
AVAILABLE FROM Publication Sales, NAESP, 1615 Duke St., Alexandria, VA 22314 ($2.50 with order; quantity discounts).
PUB TYPE Collected Works - Serials (022)
JOURNAL CIT Streamlined Seminar; v6 n4 Mar 1988

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Administrator Role; Convergent Thinking; Creative Thinking; Discovery Processes; Divergent Thinking; Elementary Secondary Education; *Group Dynamics; Logical Thinking; *Organizational Communication; Principals; *Problem Solving; Teacher Administrator Relationship; *Teamwork

ABSTRACT

This pamphlet discusses group problem solving in schools. Its point of departure is that teachers go at problems from a number of different directions and that principals need to capitalize on those differences and bring a whole range of skills and perceptions to the problem-solving process. Rather than trying to get everyone to think alike, principals should take advantage of the holistic approach of the idealists, the analysts' power of logic and deduction, the realists' ability to keep the situation in perspective, the pragmatists' drive to find the shortest route to the payoff, and the synthesists' gifts for creative speculation. A basic attraction of group processes is that one can reap the benefits of both convergent and divergent thinking, and both the analytical and the intuitive. One of the obvious advantages of group problem-solving over individual effort is that the alternative suggestions generated by a committed group will almost always be greater in number and richer in creativity. These ideas are illustrated by a series of hypothetical examples and anecdotes. (TE)

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ED296465

STREAMLINED SEMINAR

Volume 6, Number 4 March 1988

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James C. King

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Group Problem Solving

James C. King

For elementary and middle school principals, problems are what make the world go round—the staff of life, their bread and butter. No school anywhere has ever been known to face a shortage of them. Thus the ability to get problems solved, or the lack of it, is probably the chief determinant of whether a school administrator will succeed or fail.

Somehow you must move a school from the condition in which you found it to a state that demonstrates excellence. That means overcoming a myriad of difficulties that keep the teachers from achieving their potential and in general condemn the school to mediocrity.

There are doubtless many good ways to approach a situation like this but clearly one of the most effective is group problem solving—having the school's most valuable resource, the teachers, take on major responsibility for dealing with whatever roadblocks keep the school from being the first-rate operation that they and the students and the parents want it to be. As a first step in that direction, you will need to put problem solving into perspective. Stripped of the mystique and emotional concerns that often surround them, problems are simply the gap between what a situation *is* and what it *ought to be*. As someone has doubtless observed: "You only have a problem if you *think* it is a problem."

Deciding what a problem *is* will necessarily involve individual perceptions. And since individual perceptions vary, perfectly reasonable people may well disagree about what the situation actually is and whether it needs changing. You may feel that today is the nicest day so far this year, whereas your colleague who has a five o'clock appointment with an IRS auditor may feel distinctly otherwise.

When you and your teachers are trying to identify and quantify problems that need solving, you must be sure that they and you are dealing in facts, and whenever possible, in actual measurements. There may be a temptation to try to save time by making "guesstimates." Do not succumb to it. Guesstimates tend to lead to trouble. Someone cited the example of a box containing 50 facial tissues, each .001 of an inch thick and folded into the box in overlapping fashion. Suppose that as an alternative to packing 50 tissues, the manufacturer decided instead to make one large tissue and fold it 26 times. Would the result require a larger box? If so, how much larger? A guesstimate might suggest twice as large. However, if you get out your pocket calculator and figure out what happens when you double a .001-of-an-inch tissue 26 times, you find you would need a box more than a *mile* deep!

Just as what "is" is a result largely of individual perceptions, what "ought to be" is a reflection of individual values. Since values also vary, where one person may see a need for change, another may be perfectly happy with things the way they are. Thus the problem-solving process, as Snyder and Anderson (1986) have aptly described, requires group consensus on the goals to be attained.

As people mature, they develop their own ingrained ways or styles of thinking, and these naturally influence how they respond to problems. Principals who ignore this phenomenon expose themselves to considerable frustration when they find that some faculty members want to rush to immediate conclusions while others want to

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dawdle over the data for a while and still others would prefer to kick around some far out alternatives.

Harrison and Bramson (1982) have described significant differences in the ways by which problems are approached by *realists, idealists, pragmatists, analysts,* and *synthesists.* Noting that their teachers go at problems from a number of different directions and postures, principals should try to capitalize on those differences and bring a whole range of skills and perceptions to the problem-solving process.

They should in any case resist the natural urge to try to get everyone to think alike. In group problem solving, principals can take advantage of the holistic approach of the idealists, the analysts' powers of logic and deduction, the realists' ability to keep the situation in perspective, the pragmatists' drive to find the shortest route to the payoff, and the synthesists' gifts for creative speculation. A basic attraction of group processes is that you can reap the benefits of both convergent *and* divergent thinking, and both the analytical *and* the intuitive.

With the group having reached consensus regarding what the situation *is* and what it *ought to be,* the principal must help determine how to close the gap. The group's perception of what ought to be constitutes the goal, the assessment of the present situation is the starting point, and the proposed plans for closing the gap provide the alternative solutions. The greater the number of proposed plans the better. As Linus Pauling pointed out, "The best way to have a *good* idea is to have a *lot* of ideas." One of the obvious advantages of group problem-solving over individual effort is that the alternative suggestions generated by a committed group will almost always be both greater in number and richer in creativeness.

There is a story making the rounds about a professor who taught a class in creative problem solving. On the day before the final examination the professor announced that he was going to give each member of the class a barometer with which the students were to determine the height of the building they were in. Naturally, one alert student objected that the professor had picked the wrong instrument—if you were dealing with height you needed not a barometer but perhaps an altimeter. "Not if this class really taught you anything," the professor insisted.

"What is" and "What ought to be" depend on individual values and perceptions.

The next day only four students showed up for the exam. The professor shrugged his shoulders and asked each of them to take a barometer and come back in an hour with the height of the building and an explanation of how they had used the barometer to determine it. An hour later the first student reported that he had dropped the barometer from the roof of the building and used a stopwatch to time its fall to the pavement below. Then by applying the free-fall speed of falling bodies, he was able to calculate that the building was about 200 feet high. He passed.

The second student described how she had stood the 12-inch barometer on end and measured its shadow. Then measuring the shadow of the building and applying the same ratio, she figured that the building was 210 feet tall. She also passed. The third said she had tied the barometer to a length of kite string and lowered it from the roof until it touched the pavement. Then pulling in the string one foot at a time, she learned that the building was 212 feet tall. She passed, too.

The fourth student reported that the height of the building was 211 feet, 7 1/2 inches. The professor was deeply impressed and asked the student how he could be so exact, just using a barometer. The student explained that he had gone directly to the building custodian and asked if he still had the plans to the building. The custodian said he did. "Great!" said the student. "I'd like to make you a deal. You look at the plans and tell me how tall the building is and I'll give you this shiny new barometer." And of course he also passed. In doing so, he and the others demonstrated not only that there is more than one way to skin a cat but that four minds can be more productive than one and that principals need not settle for *one* "right" solution to a problem.

One of the most familiar tools for capitalizing on group imagination is brainstorming, a technique that has been widely used in working out solutions to problems and generating ideas worth pursuing. Many principals, however, do not seem to fully comprehend how to handle this process.

In brainstorming, the principal's most important responsibility is to keep the idea-generating phase distinctly separated from the critical-analysis phase. Von Oech (1983) has suggested that within every person there resides both an artist and a judge. Thus the principal must make sure that the judges don't begin to

assess any of the ideas advanced until the artists are completely finished with advancing them.

An Ohio principal who used brainstorming very effectively kept a child's tricycle horn in the faculty meeting room. When brainstorming participants felt they had been "put down" or their ideas ungraciously received, they walked over to the horn and honked it. The others were amused, but they also got the message. When a particular participant kept prompting that reaction, it became clear that something approaching bullying was going on. And similarly, when the same participant was forever honking the horn, the others could see that they were dealing with someone who was a bit oversensitive. Another principal, noting that certain individuals tended to dominate the discussion, produced a sponge rubber ball. Whoever possessed the ball had the floor exclusively until he or she passed it along to someone else. An uplifted hand indicated a request for the ball —that is, for the right to speak. This little ritual of passing the ball quickly demonstrated who the conversation-hoggers were.

Some principals are reluctant to use group problem solving on grounds that the process requires more time than they would need if they tackled the situation on their own. Clearly, schools do encounter problems that must be resolved immediately. Most, however, do not have that air of emergency, and with these the group process tends to be significantly more productive than a unilateral approach. For one thing, there are almost certain to be a greater number of alternative solutions from which to choose. Perhaps even more important, there will be a far greater willingness on the part of the teachers to accept the results. The richly different perspectives that can be focused on a problem, and the sense of "ownership" that teachers develop for their solutions, more than warrant whatever extra time may be involved.

There is a special benefit for elementary schools: Group problem solving can do much to meet the social interaction needs of teachers who spend the major part of each day in self-contained classrooms. Moreover, the process fosters group cohesion and pride in having dealt with a problem as part of a team. The time required to get a group organized and functioning is most appropriately to be seen as an investment in teacher morale and effectiveness. As teachers take on a sense of accountability for the school's progress and problems, they develop a sense of professional pride and involvement that affects not only their performance in the classroom but their attitude toward the teaching profession and the overall education process. Nothing is more likely to give teachers a greater sense of worth than the satisfaction that comes from exercising courage and imagination on behalf of improved learning for children. Further, in interacting with other professionals on problems of common concern, teachers refine their listening, evaluating, and creating skills, and their horizons are lifted as they share the insights of their colleagues.

There's more than one way to skin a cat, and four minds are more productive than one.

Each problem solving activity requires the establishment of a process for applying a wide variety of talents, data, methods, resources, and approaches to a particular situation. Having established such a process, the principal must take on the role of process manager, along with cheerleader and back patter. In that role principals can keep energy levels high and the participants productive by making each member of the group understand that their ideas and suggestions are important and valued.

In the initial stages of establishing the problem-solving process the principal will do well to see to it that the problems to be tackled are well within the group's comprehension and capacities, thus assuring a degree of success while the participants acquire confidence and competence in group problem solving. By genuinely appreciating the teachers' contributions and then enthusiastically expressing that appreciation, the principal can help establish a group ethos compounded of pride and eagerness and the satisfaction of having "done it themselves." If at first the participants seem intimidated by the process or self-conscious about speaking up, the principal can initially ask for teacher input through what Van Gundy (1984) calls "brain writing," which simply means submitting ideas in written form, anonymously, thus erasing any effect of rank or seniority and assuring that ideas are considered solely on their merits.

The principal must make it clear to the group that no determinations are to be made until all the evidence has been examined and weighed. This caution is important, for the moment people see the gap between *what is* and *what ought to be,* they begin to feel an almost irresistible compulsion to get going. In their desire to find re-

lief they feel driven to do *something* about the situation even if the "something" is not necessarily helpful.

The problem-solving process is likely to be most successful—the teachers to be most creative and the social interaction most rewarding—if the brainstorming sessions are conducted in an atmosphere marked by good humor and high spirits. When people are having a good time together they instinctively tend to feel greater openness to the ideas of others and greater willingness to risk expressing their own ideas and feelings.

Toward averting any surprises, the principal should spell out the ground rules in advance, particularly any limitations that must be observed. The group will rapidly lose their appetite for the process if they enthusiastically propose a well-thought-out resolution to a problem and discover only then that it conflicts with some rule or regulation. Ironically, the most binding constraints on a problem-solving group of teachers and administrators tend to be self-imposed. Schools are of course organizations of rules and regulations, and as Lou Rubin observed, "Many adults have a 'trained incapacity' for problem solving from years of worshipping the god of conformity." Many pregnant ideas have been squelched by the simple killer phrase, "We've never done it that way," as if the lack of a precedent precluded any possible benefit.

In any event, the problem-solving process often involves the resolution of conflict, and that fact produces a challenging situation. Most of us see conflict as being resolved through the exercise of power, with a winner prevailing over a loser. As the song notes, "It ain't necessarily so," and particularly not in group problem solving. Here the challenge is to avoid the divisiveness of win/lose and instead learn to develop solutions that are win/win. Few schools make it a point to convince their teachers and students that errors and occasional failure are a part of the growth process and thus are to be expected and tolerated. Yet reaching out to anything new inevitably brings with it the possibility of failure, and teachers must learn to regard the occasional setback—on the part of problem solvers and students alike—as a basic element of learning. A New Jersey principal has a sign in the faculty meeting room which points out that "Edison first discovered hundreds of ways *not* to make a light bulb."

The problem-solving process having been set up, the principal becomes the manager.

Although experts differ as to the ideal size of a problem-solving team, all seem agreed that if the group gets too large it ceases to be functional. Experience indicates that a group of three to six people is normally large enough to generate a good selection of alternatives and small enough to minimize the danger of becoming paralyzed by inability to reach a consensus. Unless the participants are to be self-selected, on the basis of their individual interests, the principal should appoint members on the basis of each teacher's particular skills, knowledge, experience, values, expectations, and level of motivation. The latter consideration, motivation, is of critical importance, and the principal should seek to strengthen it by assuring that the participants understand the importance the principal attaches to their contributions and by making it clear that they have taken over the "ownership" of the problem and will be the owners of the proposed solutions.

The principal should encourage the group to ask questions and to challenge all data, especially those propositions that "everybody knows" to be true. Some principals actually ask a member of the group to be the devil's advocate. At any rate, every member of the group should recognize that they are not to blindly accept anyone else's definition of a problem or statement of proof, and particularly not until they have had time to ponder the matter. Some groups find it beneficial to observe a few moments of silence from time to time, to allow the discussion to stir around in their minds.

Another useful device is to pose a hypothetical situation. When an Indiana principal asked his teachers how the school's offerings could be improved, the listless responses amounted simply to modifying the existing program a bit. Then he asked them to suppose that the state's compulsory attendance laws had been repealed, and that children came to school only if they found it interesting. What would the teachers suggest *then*? The result was an avalanche of stimulating ideas that in effect called for a complete restructuring of the school's traditional program.

It is interesting to note that when they become involved in problem-

solving groups, principals and teachers alike say they tend to *hear* more. Many principals have reported that they acquired a new awareness of what is going on in their building after hearing teachers share their perspectives on problems. The fact is that in the problem-solving process, principals and teachers soon learn, first, that if they are to be productive they must hear from all sides of a discussion; and second, that even with the simplest of problems, there is rarely one single source of the difficulty. Thus with many problems there can't *be* one magical solution; there will need to be a combination of solutions. Further, teachers and principals must develop a tolerance for ambiguity. Problems tend to be complex and difficult to describe, and people are not always terse and to the point. The members of the group must learn to feel their way through the fog. Doing so will be made easier if unclear or apparently erroneous statements are challenged and if the group examines the negative evidence as closely as it does the positive. The principal should encourage "creative discontent" and respect for minority opinions. All problems should be regarded as necessarily involving choices; the group should never settle for one "right" answer. To assist in the overall process, the principal can help by providing such information as test scores, research findings, census figures, and the results of surveys and questionnaires, and in general by seeing to it that the group gets the resources it needs.

The principal will need to be available as an enforcer—making sure, for example, that no individual dominates the discussions, lest other members feel unneeded. Rules can be offered by which the group itself can control this kind of problem—use of the little sponge ball, for example. The group should be mandated to explore and generate *new* approaches and ignore old ones, even if the new ideas would entail a wholesale departure from past practice and a complete reorganization. And no suggestion should be rejected unless it is proved to be unworkable, unacceptable, or illegal.

In preparing for the time when the solution-proposing phase has run its course, there should be a plan for reducing an array of proposed solutions to a manageable number and for absorbing overlapping ideas. Among other things the plan should establish selection criteria, criteria that reflect the school's most pressing needs.

A problem-solving group needs always to ask questions and challenge "facts."

In selecting among the various proposed solutions, the first step is to reexamine the definition of the problem and the information on which that definition was based. Then each alternative must be weighed in light of any existing constraints. DeBono (1968) proposes a "PMI" approach in which the group looks first in the "plus" direction for the advantages the solution will produce, then in the "minus" direction for the disadvantages, and then in the direction of their own individual preference. Agreement must be reached as to whether the proposal is both desirable and attainable; lacking such agreement the solution is abandoned. Based on a discussion of the probable consequences of each suggested solution, and its comparative feasibility in relation to all other suggestions, a certain number of proposals will survive as the most promising.

In implementing the selected solutions, the principal will need to identify the individuals who will supervise the change and the resources they will need. It is is important that the group and the principal undertake a public relations program both in the school and in the community, working through opinion leaders to gain general support and to stress the advantages to be realized. It is important also to determine whether anyone might feel threatened by these changes; and if so, either to show why the person's fears are unfounded or to try to implement changes so that no injury occurs.

There is a final step in group problem solving that often is omitted: evaluating how well the process worked. A timely evaluation has the threefold advantage of reinforcing the group's pride and cohesiveness, improving the group's performance by identifying what went right and what went wrong, and determining whether refinements are needed in the school's problem-solving process. Such an evaluation often involves replicating the research that went into defining the problem in the first place, reanalyzing the resultant data, and determining problems or parts of problems that remain unmet.

Where group involvement in problem solving represents a radical departure from the school's traditional way of seeking improvement, the process should be introduced gradually and with careful preparation. Initially each group may need direct management. However, as the teachers develop skills in interacting with one another, appreciation for each other's

contributions, astuteness in defining the difference between what is and

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what ought to be, and trust and confidence in their mutual ability to tackle important problems and come up with constructive solutions, they will soon be ready and eager to fly on their own.

Analyses of effective schools consistently reveal the presence of dynamic principals who work closely with teachers to set high standards and then monitor progress toward the attainment of those standards. What may well be the most useful way of achieving your school's full potential is to set up a system by which you and your teachers undertake a series of inter-related steps to recognize problems, analyze the factors that contribute to them, develop an array of practical solutions, and evaluate the results to determine what progress has been made.

In short, you would do well to establish a continuing process for group problem solving. The rewards are great—in the form not only of a more effective, more dynamic school but of an eager, avid, committed staff.

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(ISSN 0735-0023)
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Group Problem Solving
Volume 6, Number 4, March 1988

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